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Consumers' motivation for eating free-range meat or less meat

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Abstract

The present paper analyzed the motivational orientations of consumers who choose to eat (1) small portions of meat or (2) ethically distinctive meat, such as free-range meat, in relation to the motivational orientations of their opposites. Going beyond the conventional approach to consumer behavior, our work builds on recent insights in motivational psychology about the ways in which people may approach matches or avoid mismatches to a desired end-state. This provides a scientific basis for the aim to foster more sustainable food consumption and production patterns. Our approach involves a systematic analysis of consumers' goal orientations regarding meat choices in terms of their concerns with obtaining positive outcomes (i.e. promotion focus on good nutrition) and avoiding negative outcomes (i.e. prevention focus on moral and health aspects of eating). We examined how a sample of Dutch consumers (n = 939) described their chronic goal orientations regarding food, their own meat choices and, about two weeks later, their promotion- and prevention-oriented associations favoring either small portions of meat and free-range meat or their opposites. Largely in line with our hypotheses we found that the meat choices of consumers with a chronic prevention orientation were often motivated by rejecting unacceptable alternatives from their choice set. They saw "eating small portions of meat" as a match and avoided the mismatch of "large portions". Also, those of them who used to eat free-range meat considered this behavior a match and eating "meat produced by intensive farming" a mismatch. Conversely, the meat choices of consumers with a chronic promotion orientation were often motivated by choosing the best alternatives from their choice set. This was in particular relevant for their choice between "free-range meat" and "meat produced by intensive farming". Accordingly, choosing a small portion of meat was often approached with a prevention orientation and choosing free-range meat with either a prevention or a promotion orientation. These differences in motivational orientation underline that the pursuit of sustainability requires careful consideration of not just undesirable but also desirable end-states.

IVM Working Paper: I. 07/02

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About IVM

The Institute for Environmental Studies (Instituut voor Milieuvraagstukken, IVM) is the oldest academic environmental research institute in the Netherlands. Since its creation in 1971, IVM has built up considerable experience in dealing with the complexities of environmental problems. Its purpose is to contribute to sustainable development and the rehabilitation and preservation of the environment through academic research and training. The institute has repeatedly been evaluated as the best Dutch research group in this field.

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1. Introduction

Modern patterns of food consumption are overusing our natural resources (Steinfeld et al., 2006). Particularly relevant here are people's meat choices. Food production will cause much less pressure on crucial resources (i.e. energy, water, biodiversity), human health and animal welfare, if people in Western countries choose to eat smaller quantities of meat as well as types of meat that are produced in a more responsible way, such as organic or free-range meat (Aiking et al., 2006; Smil, 2000). However, many consumers, both in the United States (Heller and Keoleian, 2003) and in Europe (Bernués et al., 2003), seem to give little thought to the links between their consumption behaviors and the process of food production. Moreover, insights and instruments based on conventional economics fail to improve consumers' ability to live better by consuming less and reduce their impact on the environment in the process (Jackson, 2005). One of the prerequisites for such a change is a better understanding of their underlying motivations. A new theory (Higgins, 1997; 1998; 2000) about the regulation of goal directed behavior provides an extremely interesting scientific basis for this purpose. It can explain how consumers may get the experience of "feeling right" about what they are doing if they consume less or opt for a product at a premium price (Higgins et al., 2003). This involves the two basic motivational orientations, termed promotion and prevention, which underlie people's concerns with obtaining nurturance (e.g. nourishing food) and avoiding harm (e.g. seeing to moral and health aspects of eating) respectively. Because it is vital to obtain more insight into how the notion of food sustainability can be made more appealing, the present paper takes a closer look at the way in which a sample of Dutch consumers respond to promotion- and prevention-oriented associations favoring either free-range meat or small portions of meat versus their opposites (i.e. meat produced by intensive farming and large portions of meat).

Promotion and prevention can be seen as the dual motivational underpinnings of the sustainability concept. Because a food system is sustainable only if it can be maintained at a desirable quality level for a very long time, the two orientations are crucial for maximizing a system's qualities (e.g. promotion goals) in a responsible way (e.g. prevention of deterioration). At the individual level, a promotion focus makes the person sensitive to positive outcomes that may be gained, for example, through accomplishments, aspirations, and ideals (Higgins, 1997; 1998; 2000). A person with a prevention focus becomes sensitive to negative outcomes that have to be avoided, for example, by fulfilling one's obligations and responsibilities. Both orientations can be relevant for a person's self-regulation toward a desired end-state, either by ensuring the presence of positive outcomes that match the desired end-state (promotion focus) or by ensuring the absence of negative outcomes that mismatch the desired end-state (prevention focus). If consumers' desired end-state is "getting enough nourishment by eating the right food", their meat choices may be motivated by matches they would like to attain, such as links with free-ranging animals, or mismatches they would like to avoid, such as links with environmental deterioration. Higgins' theory specifies how people's experience of "feeling right" about what they are doing results from the psychological "fit" between their goal orientations (promotion or prevention), their means to reach the goal (eager approach or vigilant avoidance), and goal-relevant attributes of the choice options (promotion-related or prevention-related associations). Various experiments (Spiegel et al., 2004) show that a promotion focus is sustained by eagerness and doing extra things, whereas a prevention focus is sustained by vigilance and being careful. The experience of "fit"

increases the value of what people are doing. With regard to consumption, a "fitting" combination of goal orientation, means to reach the goal and goal-relevant attributes of the choice options may become linked with a product. Consumers can learn to associate products with either promotion or prevention (Zhou and Pham, 2004). For example, consumers with a promotion orientation may prefer a piece of fruit that they see as an energizer, whereas consumers with a prevention orientation may prefer fruit that they associate with health precautions (Florack and Scarabis, 2006; Spiegel et al., 2004). The difference between promotion and prevention is also related to the decision rule that consumers apply to a choice set; selection of the best alternative fits a promotion focus and rejection of unacceptable alternatives a prevention focus (Chernev, 2004). As summarized in Figure 1, the process ends with different emotional appraisals of success and failure; people feel cheerful if their approach strategy is successful, but disappointment if it fails; they feel relaxed if their avoidance strategy is successful, but concerned if it fails.

A person's momentary focus on promotion or prevention will depend on circumstances induced by the situation at hand in combination with his or her personal history and cultural background. In the case of food choices, a promotion orientation may include all the social and culinary motives that emphasize the importance of food as a positive force in life – a pattern that is quite common in countries such as France and Belgium, but less so in the United States and Japan (Rozin et al., 1999). In contrast, a prevention orientation may put much decision weight on those food choice criteria that ensure protection from personally felt threats, such as criteria on the moral and health aspects of eating. The importance attributed to health is often associated with prevention motivation (Zhou and Pham, 2004). Researchers are only beginning to examine the relationship between Higgins' motivational orientations and preferences for organic products (Grankvist et al., 2004). Several findings suggest that organic buyers often show characteristics of a chronic prevention orientation, such as wanting control over all aspects of their lives (Homer and Kahle, 1988), avoiding risks (Schifferstein and Oude Kamphuis, 1998), being inclined to reflection (Torjusen et al., 2001) and valuing a good conscience (Magnusson et al., 2003). From a sustainability perspective, it is also relevant that moderate consumption of red meat corresponds with attributing greater importance to health, naturalness of the food, weight control and ethical considerations (Pollard et al., 1998). These prevention-related associations are very interesting for research into sustainability and meat consumption, but far more evidence is required about the motivational aspects of the options.

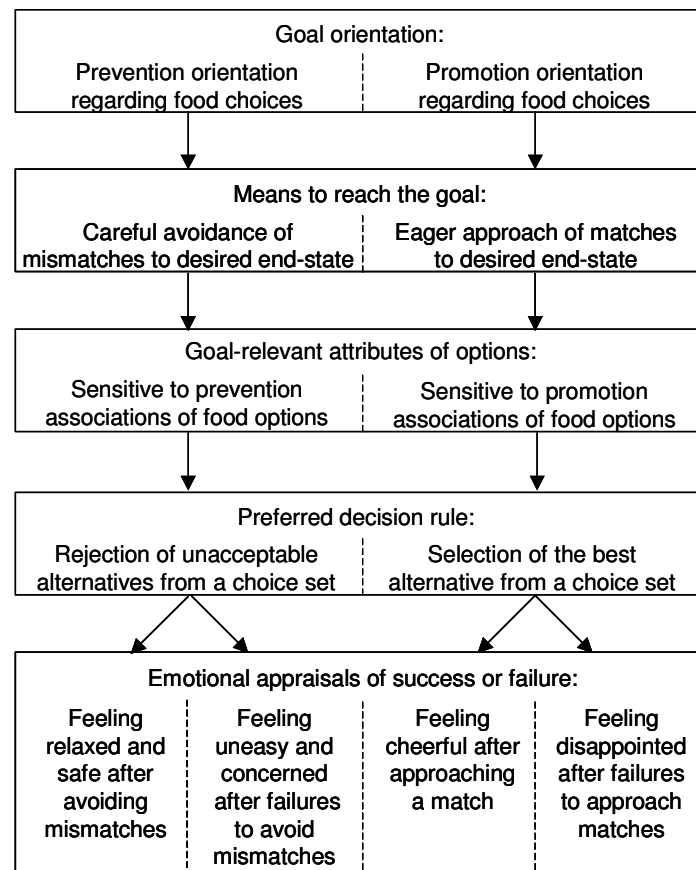


Figure 1. Main elements of Higgins' motivation theory applied to consumer behavior.

Taking this work one step further our aim in the present paper is to gain an understanding of the motivational associations of two sets of relevant behaviors, namely (1a) "eating small portions of meat," and (1b) "eating large portions of meat," (2a) "eating ethically distinctive meat, such as organic or free-range meat" and (2b) "eating meat produced by intensive farming." According to Higgins' theory, consumers may have learned to associate each of these opposing target behaviors with promotion or prevention, depending on the fit between their chronic motivational orientation regarding food and their usual behavior. As to the first pair of opposites, careful prevention may fit small portions and eager promotion large ones. Therefore, consumers with a prevention focus may evaluate "eating small portions of meat" as something that makes one feel relaxed and safe (i.e. positive prevention associations with avoiding mismatches). Consumers with a promotion orientation, however, may associate "eating small portions of meat" with disappointment (i.e. negative promotion association with failures to approach a match) and "eating large portions of meat" with cheerful feelings as an accomplishment to be proud of (i.e. positive promotion association with approaching a match). In contrast, consumers with a prevention orientation may associate "eating large portions of meat" as something that makes one feel nervous and uneasy (i.e. negative prevention association with failing to avoid a mismatch).

The second pair of behaviors refers to "free-range meat" and "meat produced by intensive farming." In this case, we expect that "free-range meat" will generally be seen as a match to the desired end-state (i.e. "getting enough nourishment by eating

the right food"). However, "meat produced by intensive farming" may be seen as a match but also as a mismatch, depending on consumers' ideas about the impacts of intensive farming methods. Given this choice set, careful prevention may fit rejecting mismatches but eager promotion selecting the best match. Hence, if consumers with a prevention orientation have learned to see "meat produced by intensive farming" as a mismatch, they may reject it from their choice set (i.e. the idea of eating this meat would imply a failure to avoid a mismatch). In contrast, if consumers with a promotion orientation consider "meat produced by intensive farming" a match, they may select either this meat or "free-range meat" as the best alternative in the choice set (i.e. the one with the strongest positive promotion associations).

Accordingly, our hypotheses involve the relationship between chronic goal orientations regarding food, own behaviors, target behaviors and the evaluative associations that the latter generate. The first hypothesis (1a) is that consumers with a chronic prevention orientation will respond with positive prevention associations to "eating small portions of meat" and with negative prevention associations to "eating large portions of meat." Similarly (1b), consumers with a chronic promotion orientation will respond with positive promotion associations to "eating large portions of meat" and with negative promotion associations to "eating small portions of meat". Hypotheses 1a and 1b mean that chronic goal orientation regarding food is a predictor of different profiles of the associations to the target behaviors. These associations will be stronger if there is a fit between their chronic goal orientation regarding food and their usual behavior. Secondly (2a), those consumers who combine a chronic prevention orientation with eating "free-range meat" will consider this behavior a match and reject "meat produced by intensive farming" from the choice set. Also (2b), consumers with a chronic promotion orientation will see either "meat produced by intensive farming" or "free-range meat" as the best alternative in the choice set in agreement with the strongest positive promotion associations. Methodologically, hypotheses 2a and 2b imply that chronic goal orientation regarding food is expected to function as a moderator of the relationship between own behavior, target behavior and evaluative associations.

In testing these predictions we collected our data via a questionnaire filled in by a sample that was taken from the general population. By using a sample of Dutch consumers, our research can stand as a good example of the North Western European situation (de Boer et al., 2006). A typical characteristic is the country's central position in an extended network of international trade, which has enabled the Netherlands to develop an extremely intensive (high input) agriculture in a very vulnerable delta. Generally, national production may also stimulate national consumption, but Dutch consumers spend a relatively small part of their household budget on meat (de Boer et al., 2006). Although annual data about the consumption of meat are difficult to interpret, due to the recent health crises and scandals in the meat sector, the figures over the past five years indicate that the per-capita gross household consumption is slightly decreasing at a rate of about 1% per year (PVE, 2007). With regard to organic sales per capita, the Netherlands has an intermediary position among the Western European countries after forerunners such as Denmark and Austria, and before France and the United Kingdom (Wier and Calverley, 2002). About 80% of the households bought at least one organic product in the year 2004, but the total number of organic purchases is low; although the sector is growing, its market share is still about 2% (Biologica, 2006). In fact, most Dutch consumers are used to buy pork and poultry that originate from intensive farming.

In sum, the paper looks at the way in which consumers respond to promotion- and prevention-oriented associations regarding the four target behaviors, designed as two pairs of opposites. A point of attention is the way in which the goal orientations can be measured. The multi-items scales presented in the literature relate to situations experienced in childhood (Higgins et al., 2001) or during college years (Lockwood et al., 2002) and make no references to food. An alternative approach that is more appropriate for a general population uses the set of value measures developed by Schwartz and his co-workers (Schwartz et al., 2001). This approach is based on the assumption that that promotion orientation is linked to value priorities that emphasize stimulating experiences and prevention orientation to value priorities that emphasize safety (Fellner et al., 2007; Kluger et al., 2004; van Dijk and Kluger, 2004). Because these value measures make no reference to food, we used them to validate a new instrument that makes a distinction between chronic prevention and promotion orientations regarding food.

2. Method

Design

The relevant measures were incorporated into two different questionnaires that were used in subsequent waves of a consumer survey among the general population. Wave 1 included questions about reported behavior (eating small or large portions, buying free-range meat or meat from intensive farming) and a set of items to measure chronic promotion and prevention orientations regarding food choices; two weeks later, wave 2 included the evaluations of the four target behaviors in terms of promotion-related or prevention-related associations. One of the other modules of wave 1 was the 40 item Portrait Value Questionnaire (PVQ) developed by Schwartz and his co-workers to measure the values people find important in their life (Schwartz et al., 2001). The survey was organized among consumers with Internet access. In 2005 this category included 78% of the Dutch households in the population under 75 years of age (CBS, 2005). In June 2005, a call to fill in a questionnaire was mailed to a stratified sample drawn from a large panel of persons who are willing to participate in web-based research for a small fee. The procedure resulted in 1530 completed questionnaires of wave 1 (response rate 71% of 2150) and 939 of wave 2 (response rate 78% of 1200). As a result of the stratified sampling procedure, the data showed an adequate distribution of the main demographic characteristics, i.e. gender (51% female), age (between 18 and 89), and level of education (25% higher education).

Own behaviour

The two pairs of opposing behaviors, eating small or large portions of meat and buying free-range meat or meat from intensive farming, were measured through two single item scales. The first scale was based on a self-categorization in terms of eating mainly large portions of meat (including poultry, excluding fish), sometimes large/sometimes small portions, mostly average, or mainly small portions, with the additional option of eating no meat at all. The participants who said not to eat meat (1.6 %) were left out of the analysis. The second scale was based on the question whether one usually buys meat (including poultry) produced by intensive farming or free-range (including organic) meat, with the additional option of not knowing where one's meat comes from. To check the consistency of the answers, some additional questions asked for the point of sale (specialty shop, up market or down-market supermarket chains), the number of days per week that meat is part of one's hot meal, and the number of days per week that one eats a meat-substitute.

Each of the two opposing ends of eating mainly "large" versus "small" portions of meat was endorsed by about 20% of the participants, "sometimes large/sometimes small" by 20% and "mostly average" by 40%. Eating mainly "small" portions correlated negatively with the number of days per week that meat is part of one's hot meal ($r = -.32$) and positively with the number of days per week that one eats a meat-substitute ($r = .23$). In testing hypotheses 1a and 1b, the two key answer categories (i.e. eating mainly "large" or "small" portions) were used to find out whether the fit between own behavior and chronic goal orientation made a difference in predicting the associations to the target behaviors. Regarding the second scale, only a small percentage (7%) said they usually ate free-range (or organic) meat, a somewhat larger percentage (25%) said they sometimes ate free-range meat and sometimes meat from intensive farming, and 11% said they usually ate meat produced by intensive farming. Remarkably, 50% said not to know where their meat comes from; 7% gave other answers. About a third of the consumers who said they usually ate free-range meat reported to have bought this product in green specialty shops and about half referred to up market supermarkets; those who said sometimes to eat free-range meat more often referred to supermarkets. These ratios are in line with marketing reports (Biologica, 2006) on consumer behavior (to be distinguished from sheer sales volumes). Hence, the 4-point scale comprises the categories: usually eats free-range meat, sometimes eats free-range meat, don't know (or other) and usually eats meat produced by intensive farming.

Chronic promotion or prevention orientations regarding food choices

Chronic promotion and prevention orientations regarding food choices should be measured in a way that allows for distinguishing these orientations from the degree to which food is relevant to the person (Avnet and Higgins, 2006). The latter refers to differences between consumers who are highly interested in this product category and those who are not (Bell and Marshall, 2003; Verbeke and Vackier, 2004). In several rounds of pilot work we developed a number of positively worded portraits of persons who show different degrees of involvement in food, both in promotion-oriented and prevention-oriented ways (de Boer et al., 2007). High involvement, for example, is expressed by the preference to vary one's meal; low involvement means that meals are not considered important. Promotion-oriented motives include enjoying eating well (in case of high involvement) or eating plenty of foods (in case of lower involvement). Prevention-oriented motives include a preference for natural products (in case of high involvement) or ordinary meals (in case of lower involvement). The items were written in a format derived from Schwartz's value questionnaire (Schwartz et al., 2001). Each item comprises two sentences in which short portraits are described to characterize a person's main food choice motive. The participants were asked to compare each portrait to themselves and to rate on a 6-point scale "how much like you" the person is. The motivational structure of Schwartz's value theory was used to check the directional differences between the food choice motives.

The 11 items that we developed are shown in Table 1, where we present the two-dimensional result of a principal component analysis before and after Varimax rotation. As recommended for this type of research (Schwartz et al., 2001), the items were centered to correct for individual differences in average similarity ratings. The two unrotated components ($\alpha = .79$ and $.55$) can be interpreted as the degree of food involvement and the direction of motivational focus, respectively. The two rotated components show particular combinations of involvement in food and motivational focus. The highly involved consumers can be split into those who are taste-oriented (high on first rotated component) and those who are reflective about food (high on

second rotated component). Similarly, consumers who are less involved may be characterized as "supporters of an ordinary meal" (low on taste-orientation), "big eaters" or "convenience eaters" (low on reflection).

Table 1. Loadings of the food choice motives before and after Varimax rotation.

Items*)	Unrotated		Rotated	
	1	2	1	2
She enjoys eating well. In her view every meal should be festive.	.60	-.44	.74	-.10
She eats because she has to. Meals are not important to her.	-.68	.24	-.72	-.12
She likes to vary her meal. She is curious about new tastes.	.68	-.24	.71	.11
She feels proud of her taste. She believes that her food choices are very attractive.	.62	-.26	.67	.07
She prefers an ordinary meal. She is happy with meat and two vegetables.	-.59	.32	-.67	-.00
Food does not bother her. She has no special demands on it.	-.80	-.08	-.67	-.46
She prefers natural products. She would really like her food fresh from the garden.	.45	.59	.11	.74
She is very mindful of food. She wants to eat sensibly.	.58	.43	.30	.66
She is grateful for her meal. In her view everything that is edible deserves respect.	.25	.58	-.06	.63
She is easy about cooking. She uses a lot of ready-made products in her meals.	-.50	-.41	-.24	-.60
She is a big eater. She loves to have plenty of palatable foods.	-.03	-.68	.30	-.61
Variance explained (%)	32	18	29	21
Alpha	.79	.55	.75	.63

*) All items have been centered (rating scale: 1= not like me at all, 6= very much like me)

Although the rotated components give an interesting and familiar picture of people's motives, the unrotated components are more important for analytical purposes as they distinguish motivational focus from involvement. In line with the motivational structure of Schwartz's value theory, the second unrotated component correlated positively with the prevention-oriented values Security ($r = .31$), Conformity ($r = .24$) and Tradition ($r = .27$) and negatively with the promotion-oriented values Self-direction ($r = -.09$), Stimulation ($r = -.31$), Hedonism ($r = -.39$), Achievement ($r = -.30$), and Power ($r = -.31$) (in all cases, $p < .001$). Higgins et al. (2001) report similar relationships in a student sample: promotion scores correlated positively and prevention scores negatively with items related to eagerness in pursuing things and willingness to take risks. To differentiate between relatively more promotion and prevention oriented participants, Higgins et al. (2001) made a median split on the difference between promotion and prevention scores. Using the same logic, we conclude that the unrotated component score is a valid measure of goal orientation that can divide consumers into those with a chronic promotion orientation and those with a chronic prevention orientation regarding food. In other words, both consumers who were reflective about food and supporters of an ordinary meal were in fact prevention oriented. Similarly, both consumers who were taste-oriented and big eaters

were promotion oriented. In testing its impacts as predictor or moderator, we use this measure after a transformation into four categories (1 highest level of promotion (more than one unit of standard deviation below the mean), 2 tends to promotion (below the mean), 3 tends to prevention (above the mean), 4 highest level of prevention (more than one unit of standard deviation above the mean)).

Ratings of promotion- or prevention-related associations

The participants were asked to consider each of the target behaviors hypothetically and to grade their evaluations in terms of eight promotion- and prevention-oriented associations. The associations were derived from key descriptions (e.g. Higgins, 1997; 1998) of promotion- and prevention-related concerns as well as the corresponding emotions that come with success and failure. The four promotion-related items refer to "fits perfectly into my ideal diet", "gives me good value for money", "is something to be proud of" (positive form) and "makes me feel disappointed" (negative form). The four prevention-related items refer to "fits a sensible life style", "makes me feel safe and familiar" (positive form), "makes me feel concerned about what I take in" and "is bad for the environment" (negative form). As these evaluative associations refer to general psychological processes, each of the associations is routine for all participants. However, the representation of the associations in a verbal form may artificially create responses that overlap, for example, due to the common positive or negative wording of the statements. This is a well-known methodological problem that can be dealt with by statistical techniques to remove the variance shared between particular associations (Boldero et al., 2005; Higgins et al., 1997). The target behaviors referred to "eating" or "buying" in a way that could be evaluated by all consumers (i.e. "If I ate small portions of meat, I would match my ideal diet"). The items were rated on a 7-point scale, ranging from fully agree to fully disagree. For the analysis, the ratings were recoded into scores from +3 to -3, with reverse scores for the negatively formulated items. As a result, a positive score on the scale means a positive promotion- or prevention-related evaluation; a negative score means a negative promotion- or prevention-related evaluation. The design of two pairs of opposing target behaviors, each rated on four promotion-related and four prevention-related items, produced 8 scales of four items (Cronbach's alpha between .59 and .73, see Table 2 below).

Analysis

The data were subjected to analyses of variance, correlation and regression. This implies that the variables were considered on interval scales, which has to be done with caution. The analysis of variance focused on the profiles of prevention and promotion related evaluations of the target behaviors, which were treated as within-subjects factors. This is in line with an extension of the repeated measures design; this approach cannot only be applied to a situation where one variable is measured at different times but also to a situation where different variables are all measured at one time (Tabachnick and Fidell, 2007; p. 311). Profile analysis is a special application of multivariate analysis of variance that can be used to compare profiles of two or more groups that may have the same pattern of means on a set of measures. When using the profile approach to repeated-measures ANOVA, the test of parallelism is the test of interaction. The groups whose profiles were compared differed in chronic prevention or promotion orientations regarding food (a between-subjects factor) and own habitual behavior (also a between-subjects factor). In testing hypotheses 1a and 1b, the between-subjects factor was high or low fit between own habitual behavior and chronic goal orientation. High fit was assumed in case the participants ate large

portions and had a promotion orientation or small portions and a prevention orientation (versus low fit otherwise). The tests of hypotheses 2a and 2b focused on the moderating impacts of chronic promotion or prevention orientation regarding food, which were elaborated in regression analyses.

3. Results

Small and large portions of meat

Our first hypothesis stated (1a) that consumers with a chronic prevention orientation will respond with positive prevention associations to "eating small portions of meat" and with negative prevention associations to "eating large portions of meat," and (1b) that consumers with a chronic promotion orientation will respond with positive promotion associations to "eating large portions of meat" and with negative promotion associations to "eating small portions of meat." The upper half of Table 2 reports how the target behaviors were rated. If both parts of the hypothesis were true, the analysis of variance would show a significant interaction effect of the factors Prevention or promotion association, Target behavior and Chronic goal orientation. However, this four-way interaction was not significant ($F(3,911) = 1.41, p > .10$). As Figure 2 demonstrates, there were significant differences between the profiles of the groups, but these agreed with hypothesis 1a only. Consumers with a chronic prevention orientation made larger differences between their associations to "eating small portions" and "eating large portions" (interaction of Target x Chronic orientation, $F(3,911) = 70.20$, partial $\eta^2 = .19, p < .001$). In general, more positive ratings were made with a prevention association than with a promotion association (effect of Association, $F(1,911) = 328.85$, partial $\eta^2 = .27, p < .001$) and "eating small portions" was rated more positively than "eating large portions" (effect of Target, $F(1,911) = 127.43$, partial $\eta^2 = .12, p < .001$), especially through prevention-related associations (interaction of Association x Target, $F(1,911) = 90.30$, partial $\eta^2 = .09, p < .001$).

Table 2. Ratings of the target behaviors on the eight scales.

Scales	Alpha	Mean	SD
Prevention associations			
Eating small portions of meat	.59	.54	1.20
Eating large portions of meat	.61	-.42	1.27
Promotion associations			
Eating small portions of meat	.70	-.17	1.35
Eating large portions of meat	.68	-.63	1.28
Prevention associations			
Meat produced by intensive farming	.73	-.31	1.28
Free-range meat	.60	1.10	1.05
Promotion associations			
Meat produced by intensive farming	.67	-.43	1.13
Free-range meat	.67	.59	1.14

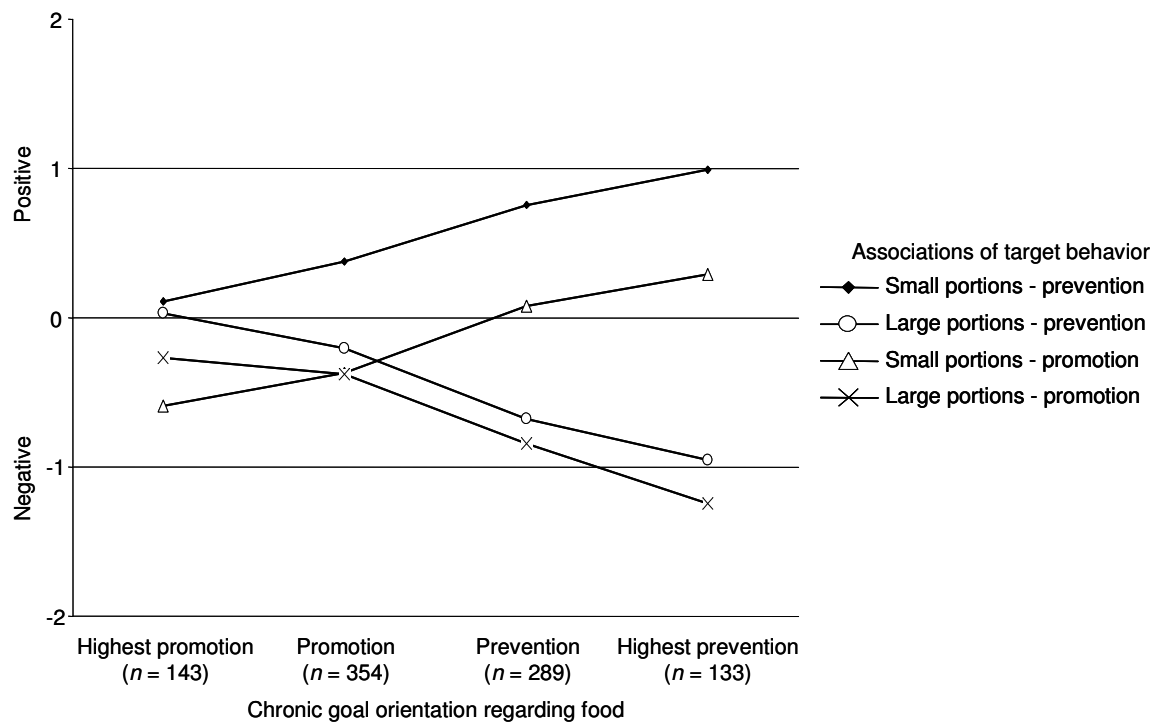


Figure 2. Mean ratings of eating "small" and "large" portions of meat in relation to chronic goal orientation regarding food.

Theoretically, the predictive impact of chronic goal orientation may be stronger among participants who experience a "fit" between their chronic orientation and their usual behavior (i.e. high fit was assumed in the case of participants who eat large portions and have a promotion orientation or eat small portions and have a prevention orientation; versus low fit otherwise). High or low fit had a large impact on the profiles (interaction of Target x Chronic orientation x Fit, $F(3,911) = 55.87$, partial $\eta^2 = .16$, $p < .001$). Figure 3 shows that the differences between the profiles were only found among the participants who had a high fit. Consumers who had a chronic prevention orientation and used to eat small portions had strong positive prevention associations to "small portions" and strong negative prevention associations to "large" ones. In contrast, consumers who had a chronic promotion orientation and used to eat large portions had relatively neutral promotion associations to "large portions". Their most salient characteristic was that they had strong negative promotion associations to "small portions." Although these consumers considered "small portions" a mismatch, the data did not support the hypothesized link between promotion orientations and large portions of meat.

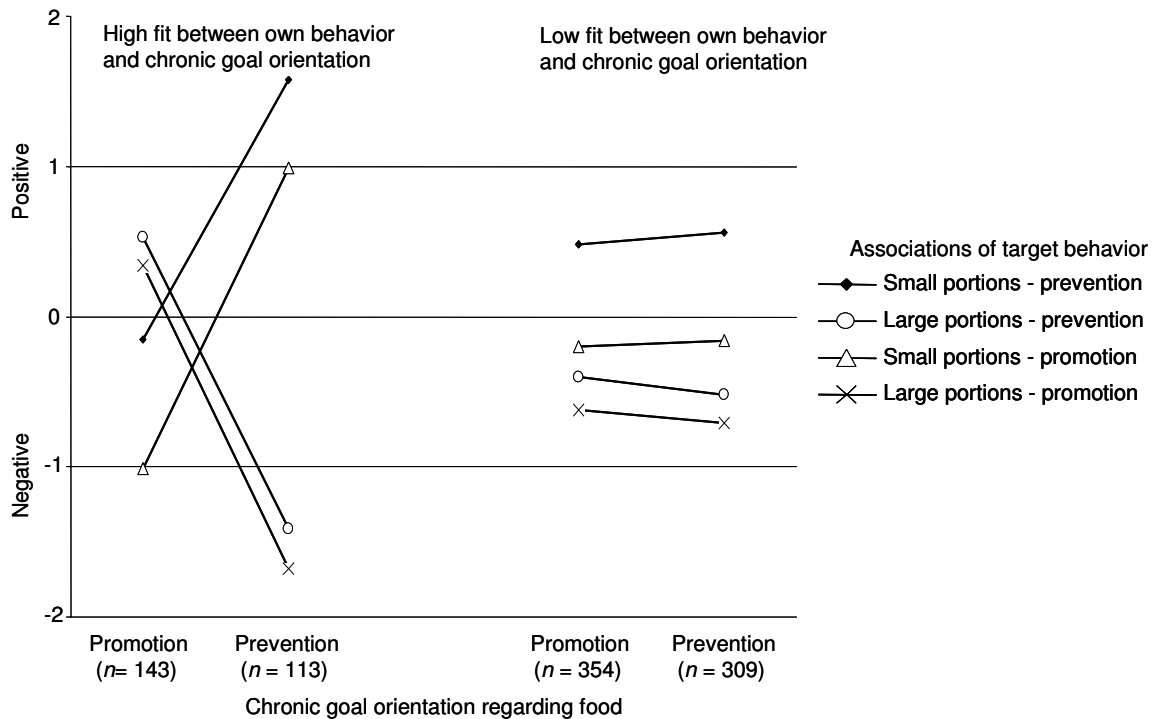


Figure 3. Mean ratings of eating "small" and "large" portions of meat in relation to high or low fit between own behavior and chronic goal orientation regarding food.

Meat produced by intensive farming or free-range meat

Our second hypothesis stated (2a) that those consumers who combine a chronic prevention orientation with eating "free-range meat" will consider this behavior a match and reject "meat produced by intensive farming" from the choice set, whereas (2b) consumers with a chronic promotion orientation will choose either "meat produced by intensive farming" or "free-range meat" as the best alternative in the choice set, dependent on the strongest positive promotion associations. The bottom half of Table 2 displays how the target behaviors "eating meat produced by intensive farming" and "eating free-range meat" were rated on the promotion- and prevention-related associations. If both parts of the hypothesis were true, the analysis of variance would show a significant interaction effect of the factors Prevention or promotion association, Target behavior, Own behavior and Chronic goal orientation. This interaction was significant, although it was not very strong (four-way interaction, $F(9,903) = 2.38$, partial $\eta^2 = .02$, $p < .05$). As Table 2 demonstrates, there were many differences between the mean ratings: prevention associations were more positive than promotion associations (effect of Association, $F(1,903) = 73.19$, partial $\eta^2 = .08$, $p < .001$), and "eating free-range meat" generated much higher positive associations than "eating meat produced by intensive farming" (effect of Target, $F(1,903) = 308.56$, partial $\eta^2 = .26$, $p < .001$), especially in terms of prevention associations (interaction of Association x Target, $F(1,903) = 43.14$, partial $\eta^2 = .05$, $p < .001$). The profiles were also dependent of the participants' own behavior and this relationship was elaborated in four regression analyses.

The hypothesized moderating impacts of chronic promotion or prevention orientation were elaborated by regressing the participants' own behavior on the promotion and prevention associations for each of the four categories of chronic goal orientation separately. The results are presented in Table 3. The regression analysis revealed that

those who were most prevention-oriented and used to eat free-range meat were not different from the others because of their positive prevention associations to "free-range meat" but because of their negative prevention associations to "meat produced by intensive farming" (i.e. negative sign of prevention associations, $\beta = -.41$). This is in line with the hypothesis (2a) that these consumers were motivated by rejecting unacceptable alternatives from their choice set. As noted above, positive prevention associations to "free-range meat" were quite common, also among those who did not buy this type of meat, but positive promotion orientations made a difference in all the four categories of chronic goal orientation. In addition, the analysis indicated that consumers who were most promotion-orientated could have positive reasons to buy meat produced by intensive farming (positive promotion associations, $\beta = -.26$) or to buy free-range meat (positive promotion associations, $\beta = .31$). This agrees with the hypothesis (2b) that the meat choices of consumers with a chronic promotion orientation were often motivated by choosing the best alternatives from their choice set.

Table 3. Regression of the participants' own behavior¹) on the associations to the target behaviors in the four categories of chronic goal orientation (standardized β 's)

	Chronic goal orientation category			
	Most prevention 1	2	3	Most promotion 4
Prevention associations to "eating meat produced by intensive farming"	-.41**	-.02	-.09	.06
Prevention associations to "eating free-range meat"	.03	-.05	.01	-.13
Promotion associations to "eating meat produced by intensive farming"	.13	-.18*	-.04	-.26*
Promotion associations to "eating free-range meat"	.31**	.28***	.20*	.31**
R square	.25	.12	.07	.12
n	133	289	354	143

* $p < .05$; ** $p < .01$; *** $p < .001$

¹) 4-point scale: 1 usually eats meat produced by intensive farming, 2 don't know, 3 sometimes eats free-range meat, 4 usually eats free-range meat.

In addition to the supportive evidence for the hypotheses, some other results should be mentioned. An important point is the large percentage (50%) who did not know where their meat comes from. Like most Dutch consumers, this group might in fact buy meats that originate from intensive farming without being explicitly informed about this, for example through on-package information. These circumstances make it easy for them to remain unaware of the methods of meat production. The mean ratings of promotion- or prevention-related associations made by this group were not significantly different from those of the participants who said to eat meat produced by intensive farming (Mann-Whitney U test, four times $p > .10$). Nevertheless, if the "don't know" or "other answers" category was left out of the analysis, the correlation and regression coefficients increased somewhat. Similar differences in effect-size are presented in Table 3; unlike the most prevention- and the most promotion-oriented category, the participants in the two intermediate categories did not produce very

outspoken results. For many participants, food choices were probably not a salient part of their daily life and that was a limiting factor for the strength of the effects. A final point is the relationship between the two pairs of opposing behaviors, type of meat and quantity of meat. Especially because of the premium price that consumers have to pay for free-range meat, some of them might have developed the strategy to combine a higher quality with a smaller quantity. There was a significant but small correlation between (1) buying free-range meat (versus meat from intensive farming) and (2) eating small (versus large) portions of meat ($r = .10, p < .01$). This correlation became somewhat stronger by taking into account not just the portion size but also other measures of being low or high on meat, such as the number of days per week that meat is part of one's hot meal and the number of days per week that one eats a meat-substitute. However, even then the coefficient is still low ($r = .18, p < .001$). After leaving out the participants who did not know where their meat comes from, the correlation became again somewhat stronger ($r = .21, p < .001$). Apparently, this type of trade-off was weakly supported by our data.

4. Discussion

In line with our hypotheses we found that consumers with a chronic prevention orientation often made their meat choices in a way that ensured the absence of negative outcomes to their desired end-state. Consistent with hypothesis 1a, these consumers used to eat small portions of meat, which they saw as a match to their desired end-state, helping them to avoid the mismatch of "large portions." Consistent with hypothesis 2a, those consumers with a chronic prevention orientation who used to eat free-range meat considered this behavior a match and eating "meat produced by intensive farming" a mismatch. Conversely, the meat choices of consumers with a chronic promotion orientation were often motivated by the matches they would like to attain. The link between chronic promotion orientation and "large portions" was less strong than expected in hypothesis 1b, however. Although eating "large portions" was not seen as a stimulating accomplishment, "small portions" were rated as a disappointment. Consistent with hypothesis 2b, we found that the matches of consumers with a chronic prevention orientation included "free-range meat" and "meat produced by intensive farming," which enabled them to select the best from their choice set.

For many participants, meat choices were not a salient part of their daily life and it underlines the power of Higgins' self-regulation theory that we found supporting evidence for the two hypotheses in this context still. The impacts of a chronic prevention orientation agree with the literature about organic food consumers, who are known to avoid risks and to value a good conscience (Homer and Kahle, 1988; Magnusson et al., 2003; Schifferstein and Oude Kamphuis, 1998; Torjusen et al., 2001). In this context, Higgins' self-regulation theory is extremely important as it provides a coherent framework to understand the relationships between the motives of these consumers. The theory explains, for example, why consumers may combine the avoidance of risks to their health with the fulfillment of moral responsibilities. The point is that both motives fit well into a prevention focus, as is illustrated by the positive loadings of being "very mindful of food" and being "grateful for her meal" on the second unrotated component in Table 1. In addition, it is interesting to note that free-range meat also had an appeal to consumers with a chronic promotion orientation regarding food. These consumers use to be driven more by taste than by moral and health issues (Florack and Scarabis, 2006; Spiegel et al., 2004) and they may associate free-range meat with sensory quality, for example.

Overall, "eating free-range meat" generated more positive associations than "eating meat produced by intensive farming", especially in terms of prevention associations. To put it simply, many consumers were not very enthusiastic about intensive farming methods and they considered free-range meat more desirable. The latter consideration, however, was not a decisive factor to buy free-range meat. This type of result resembles the well-known discrepancy that has often been described in the literature as the weak link between a pro-environmental attitude and pro-environmental behavior (Biel and Dahlstrand, 2005; Tanner et al., 2004; Thøgersen and Ölander, 2006). However, based on Higgins' theory about the regulation of goal directed behavior in terms of matches and mismatches we can take this work one step further. The point is that those who were prevention-oriented and used to eat free-range meat were not different from the others because of their positive prevention associations to "free-range meat" but because of their negative prevention associations to "meat produced by intensive farming." For them, eating the latter type of meat would be the equivalent of a failure to avoid a mismatch. In other words, knowing that consumers have a pro-environmental attitude is not enough to gain an understanding of what they see as matches and mismatches to their desired end-state. Next, it is crucial to assess whether they tend to use approach or avoidance strategies to reach their goals. As our results demonstrated, both types of consumers may have quite different reasons for choosing the same product and paying its premium price.

In our analysis we assumed that "getting enough nourishment by eating the right food" is a desired end-state for many consumers and that their meat choices can be understood in terms of matches and mismatches to this broadly denoted state. It is feasible that some consumers had more specific goals in which any link with conventional agriculture is deemed undesirable. Such an end-state gives rise to discrepancy-amplifying (instead of discrepancy-reducing) inclinations. The consequences of discrepancy-amplifying inclinations depend on the person's chronic goal orientation (Higgins, 1997; 1998; 2000). If these consumers have a chronic prevention orientation, their preferred strategy is to avoid any potential matches to the undesirable end-state, which may result in avoiding all kinds of meat. Indeed, a few participants with a chronic prevention orientation had to be left out of the analysis because they did not eat meat. If a link with conventional agriculture is an undesirable end-state to consumers with a chronic promotion orientation, they may focus their preferred approach strategy on mismatches to the undesired end-state. Theoretically, choosing free-range meat might be the result of negative reasons (i.e. as a mismatch to the undesired end-state of a link with conventional agriculture). Although we cannot rule out this interpretation, the positive impacts of the promotion associations presented in Table 3 seem to be more inspired by a strategy to reduce discrepancies with a desired end-state. Generally, undesirable end-states provide unstable feedback loops if they just call for enlarged discrepancies between the present state and the aversive reference values, without goals to head towards (Carver, 2006; Carver and Scheier, 2002).

The practical implications of our work are closely related to the different ways in which consumers may try to achieve desirable end-states. Policy-makers in government and industry can make the notion of food sustainability more appealing by taking into account how consumers with a prevention- and a promotion-orientation consider their choice sets. For prevention-oriented consumers it is important to have food options that agree with a lot of constraints, including quality, health and moral aspects. For promotion-oriented consumers it is important that the more sustainable option in their choice set is also the best option in terms of other promotion-related

aspects, such as taste. Interestingly, our results indicated that "large portions of meat" might not be especially attractive to these consumers. This might support the strategy to combine a higher quality with a smaller quantity. Policy-makers can use these considerations to identify and breakdown barriers for the pursuit of food sustainability, to reinforce "green marketing" and to improve consumers' satisfaction with their consumption. Enabling people to get the experience of "feeling right" about their choices may improve their ability to live better by consuming less and reduce their impact on the environment in the process (Jackson, 2005).

One of the limitations of this paper is that the motivational orientations were not under experimental control. The results were dependent on the degree to which the participants were able and willing to understand the subtle differences between the questions. Due to the common positive wording of the statements, prevention-related and promotion-related associations were highly correlated, which reduces the power of the analytical methods (Boldero et al., 2005; Higgins et al., 1997). A closely related issue is the validation of the differences between promotion and prevention. Our approach was based on the assumption that that promotion orientation is linked to value priorities that emphasize stimulating experiences and prevention orientation to value priorities that emphasize safety (Fellner et al., 2007; Kluger et al., 2004; van Dijk and Kluger, 2004). Although our results were quite satisfactory and Higgins' theory has proven its value in many settings (Higgins, 1997; 1998; 2000), further work is necessary to improve these measures for research in the field of food and sustainability. Further research should also examine the relationship between promotion, prevention and quality of life (Grant and Higgins, 2003) and the relevance of this motivational approach to other areas of consumption.

5. Conclusion

The insights of Higgins on goal orientations are crucial for the aim to foster more sustainable food consumption and production patterns. Our results demonstrated that choosing a small portion of meat was often approached with a prevention orientation and choosing free-range meat with either a prevention or a promotion orientation. These differences in motivational orientation underline that the pursuit of sustainability requires careful consideration of not just undesirable but also desirable end-states. Promotion and prevention orientations may function as complementary motivational underpinnings of food sustainability, because both can involve quite different segments of consumers who may have quite different reasons for choosing the same product and paying its premium price. Involving more consumers is crucial for food sustainability, because many of them appeared to give little thought to the links between their consumption behaviors and the way in which their meat had been produced. Increasing their involvement can be a matter of highlighting the matches they might like to attain, such as links with free-ranging animals, and the mismatches they might like to avoid, such as links with environmental deterioration. However, making food production more transparent will only be a first step to maximize consumers' motivation. In addition, they should be enabled to experience a psychological "fit" between their chronic promotion or prevention orientation regarding food and their means of goal pursuit by being eager or being careful, respectively. It is this "fit" that can give them the experience of "feeling right" about what they are doing.

References

- Aiking, H., de Boer, J., and Vereijken, J.M., 2006. *Sustainable protein production and consumption: Pigs or peas?* Springer, Environment & Policy, Volume 45, Dordrecht.
- Avnet, T. and Higgins, E.T., 2006. Response to comments on "How regulatory fit affects value in consumer choices and opinions". *Journal of Marketing Research*, 43, 24-27.
- Bell, R. and Marshall, D.W., 2003. The construct of food involvement in behavioral research: scale development and validation. *Appetite*, 40, 235-244.
- Bernués, A., Olaizola, A., and Corcoran, K., 2003. Labelling information demanded by European consumers and relationships with purchasing motives, quality and safety of meat. *Meat Science*, 65, 1095-1106.
- Biel, A. and Dahlstrand, U., 2005. Values and habits: a dual-process model. In: S. Krarup and C.S. Russell (Editors), *Environment, information and consumer behaviour*. Edward Elgar, Cheltenham, UK, pp. 35-52.
- Biologica, 2006. *EKO monitor, cijfers en trends, jaarrapport 2005* (Annual monitor of the organic sector in the Netherlands). Biologica, available at www.biologica.nl, Utrecht.
- Boldero, J.M., Moretti, M.M., Bell, R.C., and Francis, J.J., 2005. Self-discrepancies and negative affect: A primer on when to look for specificity, and how to find it. *Australian Journal of Psychology*, 57, 139-147.
- Carver, C.S., 2006. Approach, avoidance, and the self-regulation of affect and action. *Motivation and Emotion*, 30, 105-110.
- Carver, C.S. and Scheier, M.F., 2002. Control processes and self-organization as complementary principles underlying behavior. *Personality and Social Psychology Review*, 6, 304-315.
- CBS, 2005. *De digitale economie 2005*. Centraal Bureau voor de Statistiek (Statistics Netherlands), Voorburg.
- Chernev, A., 2004. Goal-attribute compatibility in consumer choice. *Journal of Consumer Psychology*, 14, 141-150.
- de Boer, J., Helms, M., and Aiking, H., 2006. Protein consumption and sustainability: diet diversity in EU-15. *Ecological Economics*, 59, 267-274.
- de Boer, J., Hoogland, C.T., and Boersema, J.J., 2007. Towards more sustainable food choices: Value priorities and motivational orientations. *Food Quality and Preference*, 18, 985-996.
- Fellner, B., Holler, M., Kirchler, E., and Schabmann, A., 2007. Regulatory Focus-Scale (RFS): Development of a scale to record dispositional regulatory focus. *Swiss Journal of Psychology*, 66, 109-116.
- Florack, A. and Scarabis, M., 2006. How advertising claims affect brand preferences and category-brand associations: the role of regulatory fit. *Psychology & Marketing*, 23, 741-755.
- Grankvist, G., Dahlstrand, U., and Biel, A., 2004. The impact of environmental labelling on consumer preference: negative vs. positive labels. *Journal of Consumer Policy*, 27, 213-230.
- Grant, H. and Higgins, E.T., 2003. Optimism, promotion pride, and prevention pride as predictors of quality of life. *Personality and Social Psychology Bulletin*, 29, 1521-1532.
- Heller, M.C. and Keoleian, G.A., 2003. Assessing the sustainability of the US food system: a life cycle perspective. *Agricultural Systems*, 76, 1007-1041.
- Higgins, E.T., 1997. Beyond pleasure and pain. *American Psychologist*, 52, 1280-1300.
- Higgins, E.T., 1998. Promotion and prevention: Regulatory focus as a motivational principle. In: M.P. Zanna (Editor), *Advances in experimental social psychology*. Academic Press, San Diego, CA, pp. 1-46.
- Higgins, E.T., 2000. Making a good decision: value from fit. *American Psychologist*, 55, 1217-1230.

- Higgins, E.T., Friedman, R.S., Harlow, R.E., Idson, L.C., Ayduk, O.N., and Taylor, A., 2001. Achievement orientations from subjective histories of success: promotion pride versus prevention pride. *European Journal of Social Psychology*, 31, 3-23.
- Higgins, E.T., Idson, L.C., Freitas, A.L., Spiegel, S., and Molden, D.C., 2003. Transfer of value from fit. *Journal of Personality and Social Psychology*, 84, 1140-1153.
- Higgins, E.T., Shah, J.Y., and Friedman, R., 1997. Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology*, 72, 515-525.
- Homer, P.M. and Kahle, L.R., 1988. A structural equation test of the value-attitude-behavior hierarchy. *Journal of Personality and Social Psychology*, 54, 638-646.
- Jackson, T., 2005. Live better by consuming less? Is there a "double dividend" in sustainable consumption? *Journal of Industrial Ecology*, 9, 19-36.
- Kluger, A.N., Stephan, E., Ganzach, Y., and HersHKovitz, M., 2004. The effect of regulatory focus on the shape of probability-weighting function: Evidence from a cross-modality matching method. *Organizational Behavior and Human Decision Processes*, 95, 20-39.
- Lockwood, P., Jordan, C.H., and Kunda, Z., 2002. Motivation by positive or negative role models: regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology*, 83, 854-864.
- Magnusson, M.K., Arvola, A., Koivisto Hursti, U.-K., Åberg, L., and Sjöden, P.O., 2003. Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite*, 40, 109-117.
- Pollard, T.M., Steptoe, A., and Wardle, J., 1998. Motives underlying healthy eating: using the Food Choice Questionnaire to explain variation in dietary intake. *Journal of Biosocial Science*, 30, 165-179.
- PVE, 2007. *De Nederlandse vee-, vlees- en eiersector in cijfers. Het jaar 2006 voorlopig* (Livestock, meat and eggs in the Netherlands). Productschappen Vee, Vlees en Eieren (Product Boards for Livestock, Meat and Eggs), Zoetermeer.
- Rozin, P., Fischler, C., Imada, S., Sarubin, A., and Wrzesniewski, A., 1999. Attitudes to food and the role of food in life in the U.S.A., Japan, Flemish Belgium and France: possible implications for the diet-health debate. *Appetite*, 33, 163-180.
- Schifferstein, H.N.J. and Oude Kamphuis, P.A.M., 1998. Health-related determinants of organic food consumption in the Netherlands. *Food Quality and Preference*, 9, 119-133.
- Schwartz, S.H., Melech, G., Lehmann, A., Burgess, S., Harris, M., and Owens, V., 2001. Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross-Cultural Psychology*, 32, 519-542.
- Smil, V., 2000. *Feeding the world: a challenge for the twenty-first century*. The MIT Press, Cambridge, MA.
- Spiegel, S., Grant-Pillow, H., and Higgins, E.T., 2004. How regulatory fit enhances motivational strength during goal pursuit. *European Journal of Social Psychology*, 34, 39-54.
- Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M., and de Haan, C., 2006. *Livestock's long shadow; environmental issues and options*. Food and Agriculture Organization of the United Nations (FAO), Rome.
- Tabachnick, B.G. and Fidell, L.S., 2007. *Using multivariate statistics*. Pearson/Allyn and Bacon, Boston, MA.
- Tanner, C., Kaiser, F.G., and Wolfing Kast, S., 2004. Contextual conditions of ecological consumerism - A food-purchasing survey. *Environment and Behavior*, 36, 94-111.
- Thøgersen, J. and Ölander, F., 2006. To what degree are environmentally beneficial choices reflective of a general conservation stance? *Environment and Behavior*, 38, 550-569.

- Torjusen, H., Lieblein, G., Wandel, M., and Francis, C.A., 2001. Food system orientation and quality perception among consumers and producers of organic food in Hedmark County, Norway. *Food Quality and Preference*, 12, 207-216.
- van Dijk, D. and Kluger, A.N., 2004. Feedback sign effect on motivation: Is it moderated by regulatory focus? *Applied Psychology: An International Review*, 53, 113-135.
- Verbeke, W. and Vackier, I., 2004. Profile and effects of consumer involvement in fresh meat. *Meat Science*, 67, 159-168.
- Wier, M. and Calverley, C., 2002. Market potential for organic foods in Europe. *British Food Journal*, 104, 45-62.
- Zhou, R.R. and Pham, M.T., 2004. Promotion and prevention across mental accounts: when financial products dictate consumers' investment goals. *Journal of Consumer Research*, 31, 125-135.

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